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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,438	01/11/2002	Slade H. Gardner	TA-00523	8581

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James E. Bradley
BRACEWELL & PATTERSON, LLP
711 Louisiana Street, Suite 2900
Houston, TX 77002-2781

EXAMINER	
STAICOVICI, STEFAN	

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/044,438	GARDNER, SLADE H.	
	Examiner	Art Unit	
	Stefan Staicovici	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *22-27* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 6-13, 16-21* is/are rejected.

7)☒ Claim(s) *4,5,14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/4/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-21 in the reply filed on August 2, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Specification

2. The preliminary amendment filed January 11, 2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material that is not supported by the original disclosure is as follows: the material of the vacuum bag is described in the original disclosure as "polyamide," whereas Applicant has amended "polyamide" to "polyimide" which is a totally different material.

Applicant is required to cancel the new matter in the reply to this Office Action.

3. The disclosure is objected to because of the following informalities: in paragraph [0004], line 5, "mole" should be replaced with --mold--..

Appropriate correction is required.

Claim Objections

4. Claims 4 and 5 are objected to because of the following informalities: in claim 4, line 2, "fuitive" should be replaced with --fugitive--. Claim 5 is objected to as a dependent claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1 and 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Jager (US Patent No. 5,439,627) in view of Wood *et al.* (US Patent No. 6,537,470 B1).

De Jager ('627) teaches the basic claimed process of forming a composite component including, providing a sheet of continuous longitudinal fibers, impregnating said sheet with a temporary (fugitive) binder, pyrolizing said binder by heating in an inert atmosphere to form a porous preform, placing said preform in a mold, infiltrating a resin into said porous preform and curing the resin to form said composite component (see Abstract; col. 5, line 55 through col. 6, line 3; col. 7, line 68; col. 8, lines 34-50 and col. 13, lines 8-61).

Regarding claims 1 and 11, although De Jager ('627) teaches vacuum infiltration of a porous preform, De Jager ('627) does not teach a resin transfer molding process. Wood *et al.* ('470 B1) teach a resin transfer molding process to infiltrate a carbon, fibrous porous preform including, placing said preform into a mold, injecting a molten resin or pitch into the mold,

allowing the resin or pitch to cool below the melting point, and removing the impregnated preform from the mold (see col. 4, lines 33-38). Further, Wood *et al.* ('470) teach that the mold includes a top half, a bottom half opposed to the top half so that the top half and the bottom half form a mold cavity, at least one gate disposed in the top half or the bottom half, a valve that can admit resin into the gate and an arrangement for providing venting and/or vacuum to the mold (see col. 4, lines 38-45). Furthermore, Wood *et al.* ('470) teach heating of the porous preform prior or after being placed in the mold (see col. 4, lines 45-55). Therefore, it would have been obvious for one of ordinary skill in the art to have used the resin transfer molding process of Wood *et al.* ('470) to densify the carbon, fibrous porous preform of De Jager ('627) because, Wood *et al.* ('470) teach that resin transfer molding provides for an improved process by reducing cycle time (see col. 2, lines 1-15), hence providing for an improved product.

In regard to claims 6-8, De Jager ('627) teaches a olefine binder (thermoplastic) and a water-soluble bonder (methylcellulose) (see col. 6, lines 19-24).

Specifically regarding claims 9-10, De Jager ('627) teaches carbon fibers (see col. 5, line 20) and silicon carbide fibers (see col. 5, line 31).

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over De Jager (US Patent No. 5,439,627) in view of Wood *et al.* (US Patent No. 6,537,470 B1) and in further view of Hoge (US Patent No. 5,942,182).

De Jager ('627) in view of Wood *et al.* ('470) teach the basic claimed process as described above.

Regarding claim 2, although De Jager ('627) in view of Wood *et al.* ('470) teach a mold having an upper and a lower mold half for a resin transfer molding process, De Jager ('627) in

view of Wood *et al.* ('470) do not teach that one mold half is a vacuum bag. However, the use of a vacuum bag as a mold half is well known as evidenced by Hoge ('182) who teaches that a vacuum assisted resin transfer molding process is equivalent to a resin transfer molding process to impregnate a fibrous preform (see col. 1, lines 13-54). Therefore, it would have been obvious for one of ordinary skill in the art to have used a vacuum bag as an equivalent alternative to a mold half as taught by Hoge ('182) in the process of De Jager ('627) in view of Wood *et al.* ('470) because, Hoge ('182) teaches that a vacuum assisted resin transfer molding process is equivalent to a resin transfer molding process when impregnating a fibrous preform and also to reduce costs by eliminating a mold half and an injection system.

8. Claims 3, 12 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Jager (US Patent No. 5,439,627) in view of Wood *et al.* (US Patent No. 6,537,470 B1) and in further view of Jones *et al.* (US Patent No. 5,023,041).

De Jager ('627) in view of Wood *et al.* ('470) teach the basic claimed process as described above.

Regarding claims 3 and 12, De Jager ('627) in view of Wood *et al.* ('470) do not teach flowing a gas into the mold cavity. It is noted that Wood *et al.* ('470) teach that the mold includes a top half, a bottom half opposed to the top half so that the top half and the bottom half form a mold cavity, at least one gate disposed in the top half or the bottom half, a valve that can admit resin into the gate and an arrangement for providing venting and/or vacuum to the mold (see col. 4, lines 38-45). Jones *et al.* ('041) teach a resin transfer molding process including, forcing a pressurized gas into the mold cavity (see Abstract). Therefore, it would have been obvious for one of ordinary skill in the art to have forced a pressurized gas into the mold cavity

as taught by Jones *et al.* ('041) in the process of De Jager ('627) in view of Wood *et al.* ('470) because, Jones *et al.* ('041) specifically teaches that such a process reduces voids in the molded product, hence providing for an improved product.

In regard to claims 16-18, De Jager ('627) teaches a olefine binder (thermoplastic) and a water-soluble bonder (methylcellulose) (see col. 6, lines 19-24).

Specifically regarding claims 19-20, De Jager ('627) teaches carbon fibers (see col. 5, line 20) and silicon carbide fibers (see col. 5, line 31).

Regarding claim 21, De Jager ('627) teaches vacuum infiltration of resin (see col. 16, line 56), whereas Wood *et al.* ('470) teach providing a vacuum prior and during injection of the resin (see col. 10, lines 28-31). Hence, it is submitted that vacuum is provided during resin injection in the process of De Jager ('627) in view of Wood *et al.* ('470) and in further view of Jones *et al.* ('041).

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over De Jager (US Patent No. 5,439,627) in view of Wood *et al.* (US Patent No. 6,537,470 B1) and in further view of Jones *et al.* (US Patent No. 5,023,041) and Hoge (US Patent No. 5,942,182).

De Jager ('627) in view of Wood *et al.* ('470) and in further view of Jones *et al.* ('041) teach the basic claimed process as described above.

Regarding claim 13, although De Jager ('627) in view of Wood *et al.* ('470) and in further view of Jones *et al.* ('041) teach a mold having an upper and a lower mold half for a resin transfer molding process, De Jager ('627) in view of Wood *et al.* ('470) and in further view of Jones *et al.* ('041) do not teach that one mold half is a vacuum bag. However, the use of a vacuum bag as a mold half is well known as evidenced by Hoge ('182) who teaches that a

vacuum assisted resin transfer molding process is equivalent to a resin transfer molding process to impregnate a fibrous preform (see col. 1, lines 13-54). Therefore, it would have been obvious for one of ordinary skill in the art to have used a vacuum bag as an equivalent alternative to a mold half as taught by Hoge ('182) in the process of De Jager ('627) in view of Wood *et al.* ('470) and in further view of Jones *et al.* ('041) because, Hoge ('182) teaches that a vacuum assisted resin transfer molding process is equivalent to a resin transfer molding process when impregnating a fibrous preform and also to reduce costs by eliminating a mold half and an injection system.

Allowable Subject Matter

10. Claims 4-5 and 14-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (571) 272-1208. The examiner can normally be reached on Monday-Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stefan Staicovici, PhD

Stefan Staicovici 10/15/04

Primary Examiner

AU 1732

October 15, 2004